



## Some informations on RF-interferences in the studio

Neumann condenser microphones are protected through various means very effectively against RF interferences so that they may be used also in those cases where other microphones due to heavy RF radiation do not perform satisfactorily. Some of our past years experiences pertaining to this problem have been collected here for the purpose of helping to identify this type of interference and to simplify its removal.

1. RF frequencies always enter through the microphone cable and never through the capsule housing.
2. All microphone cable couplings must be arranged so that the cable shield is connected to the connector shell at both ends of the cable. It is not sufficient to connect the shield only through the relevant plug pins. The shield must be soldered to the connector shell. In case of heavy RF radiation it is not sufficient to only clamp the shield by means of a screw. All connecting cables supplied by Neumann comply with these requirements. Very often when our customers prepare their own cables the before mentioned interference problems appear, because the prerequisites are not adhered to during cable assembly.
3. Microphone cables with a woven shield have a remarkably lower degree of covering an area than such cables using counterrotating double reusen shielding. For this reason cables with reusen shielding are remarkably better protecting against RF interference. Neumann microphone cables are using this counterrotating double reusen shielding. Cables which are shielded only through conductive plastic material are not RF-proof.
4. Only demodulated high frequencies appear as interference. Semiconductor circuits, especially the gates of the fieleffect transistors, may therefore not have any capacitive coupling to RF frequency signals.
5. If it is not sure whether the demodulation happens in the microphone or in other equipment to which the microphone is connected, it is recommended to test this by means of a 200 Ohms equivalent resistor built into a plug which is connected instead of the microphone, or with a dynamic microphone.

6. Only amplitude modulated RF leads to interference. Interferences caused by FM-transmitters are not known to us.
7. For interference caused by standard broadcast and short wave transmitters the audio program becomes audible. With TV-transmitters the frame frequency (50 Hz or 60 Hz) is perceived and is easily confused with AC power line hum. If the interference level fluctuates strongly with movement of the microphone or cable then a TV-transmitter is the probable source of the interference.
8. Because TV-transmitter antennas are usually placed at high elevations and most often radiate with horizontal polarization, antenna masts located in the immediate proximity often do not present the danger that those located further away do.
9. Older microphones of the type U 87 can, if necessary, be modified to up to date circuitry and thereby become virtually as RF-proved as the other microphones. This applies mainly for the exchange of the transformer 09013 against the type 90415 (with electrostatic shield winding, which is standard beginning with circuit status 19) and the installation of the RF-rejection filter in the base plate of the microphone (choke 1 and 2 with C 16 and C 17, which is standard beginning with circuit status 17).